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CLAIM + DETAILED DESCRIPTION

[Claim(s)]

[Claim 1] The hydrogenation block copolymer which is characterized by providing the following and which is obtained by hydrogenating a block copolymer (a (a-2)-1), And (a-3) at least a kind of elastomer 100 weight part chosen from the group which consists of olefin system copolymer rubber, (b) The thermoplastic elastomer composition obtained by carrying out fusion kneading of the constituent containing amorphous polyolefin 0.1 - 250 weight parts and (c) organic peroxide 0.01 - 1.20 weight parts (a) (a-1) At least two of the polymer blocks A which use aromatic vinyls as a subject At least one of the polymer blocks B which use a conjugated diene compound as a subject

[Claim 2] (d) The thermoplastic elastomer composition according to claim 1 which contains further the softener 1 for non-aromatic system rubber - 100 weight parts.

[Claim 3] (e) The thermoplastic elastomer composition according to claim 1 or 2 which contains further low-specific-gravity paraffin 1 - 100 weight parts.

[Claim 4] (f) Claim 1 which contains further peroxide decomposition type olefin system resin 1 - 100 weight parts - a thermoplastic elastomer composition given in any 1 clause of three.

[Claim 5] (g) Claim 1 which contains further the inorganic bulking agent 1 - 200 weight parts - thermoplastic elastomer composition given in any 1 clause of four.

[Claim 6] (h) Claim 1 which contains further the ester system coagent 1 - 45 weight parts - a thermoplastic elastomer composition given in any 1 clause of five.

[Claim 7] The automatic in-the-car exterior member, the member for construction packing, or the member for household appliance packing which carries out the fabrication of the thermoplastic elastomer composition of a description to Claim 1 - any 1 clause of six.

[Detailed Description of the Invention]

[0001]

[Field of the Invention] Especially this invention relates to the thermoplastic elastomer composition which is excellent in the bleed resistance of heat deformation properties, extrusion nature, injection-molding nature, a lamina, and multilayer mold goods, grip nature, etc. about a thermoplastic elastomer composition.

[0002]

[Description of the Prior Art] It is the flexible material which has rubber elasticity, and a vulcanization process is not needed but the thermoplastic elastomer in which the same fabrication nature and same recycling as thermoplastics are possible is used abundantly in recent years in the field of autoparts, household appliance parts, a wire covering, medical application parts, footwear, miscellaneous goods, etc.

[0003] Polystyrene system thermoplastic elastomers which are the block copolymers of an aromatic-vinyls-conjugated diene compound also in a thermoplastic elastomer, such as styrene butadiene block polymer (SBS) and styrene isoprene block polymer (SIS), are rich in plasticity. The thermoplastic elastomer composition which has good rubber elasticity in ordinary temperature, and is obtained from these is excellent in workability. It is widely used as a substitute of vulcanized rubber.

[0004] Moreover, the elastomer composition which hydrogenated the intramolecular double bond of styrene in these elastomers and the block copolymer of conjugated diene is used abundantly still more widely as an elastomer which raised heat aging characteristics (thermal stability) and weatherability.

[0005] However, the thermoplastic elastomer composition using these hydrogenation block copolymers, As what a problem is still in rubber characteristics, for example, oil resistance, and the heating pressurization reduction of area (compression permanent deformation) and the rubber elasticity at the time of high temperature, and improves this point The bridge formation object acquired by making the constituent containing the hydrogenation derivative of the above-mentioned block copolymer construct a bridge is proposed (for example, JP,S59-6236,A, JP,S63-57662,A, JP,H3-49927,B, JP,H3-11291,B, and JP,H6-13628,B).

[0006] Moreover, the present condition is not having reached the performance level which especially the bridge formation constituent of the hydrogenation block copolymer currently indicated by the above-mentioned gazette has the problem the compression permanent deformation at 100 degrees C being still inadequate at the time of high temperature, and machine hardness falling easily, and is conventionally demanded for the vulcanized rubber use. Moreover, it also has many problems of a fabrication side that form holdout gets worse in extrusion since the melt tension at the time of high temperature is low, and a molding cycle becomes long in injection molding etc.

[0007] Furthermore, in this case, each constituent indicated by the above-mentioned gazette is, although it is 40 or more in the Shore A hardness and is made to soften by increasing the quantity of the loadings of a softener, The present condition is smeariness's occurring on the mold-goods surface, or producing the bleed out of a softener under a heating stress, and including practically preferably the problem of being especially inferior to the grip nature of the lip and automotive body in an automatic in-the-car exterior member etc.

[0008]

[Problem(s) to be Solved by the Invention] In view of the above-mentioned problem, this invention Extrusion

nature, injection-molding nature, a lamina, and the bleed resistance of multilayer mold goods, It aims at offering the inner exterior member of the car which is excellent in grip nature with heat deformation properties, a paint board, a glass plate, etc., the member for construction packing, and the thermoplastic elastomer composition for members for household appliance packing.

[0009]

[Means for Solving the Problem] As a result of repeating research wholeheartedly that the above-mentioned purpose should be attained, this invention persons blended amorphous polyolefin with the styrene system elastomer, by carrying out bridge formation treatment, found out that the thermoplastic elastomer which is excellent in grip nature and a heat-resisting property was obtained, and completed this invention.

[0010] Namely, at least two of the polymer blocks A with which invention of the 1st of this invention uses (a) (a-1) aromatic vinyls as a subject The block copolymer which consists of at least one of the polymer blocks B which use a conjugated diene compound as a subject, The hydrogenation block copolymer hydrogenated and obtained, (a-2) (a-1) And (a-3) at least a kind of elastomer 100 weight part chosen from the group which consists of olefin system copolymer rubber, (b) It is the thermoplastic elastomer composition obtained by carrying out fusion kneading of the constituent containing amorphous polyolefin 0.1 - 250 weight parts and (c) organic peroxide 0.01 - 1.20 weight parts.

[0011] Moreover, invention of the 2nd of this invention is a thermoplastic elastomer composition given in the 1st invention which contains further the softener 1 for (d) non-aromatic system rubber - 100 weight parts.

[0012] Moreover, invention of the 3rd of this invention is a thermoplastic elastomer composition given in invention of the 1st or 2 which contains further (e) low-specific-gravity paraffin 1 - 100 weight parts.

[0013] Moreover, invention of the 4th of this invention is a thermoplastic elastomer composition given in the 1-3rd ones which contain further (f) peroxide decomposition type olefin system resin 1 - 100 weight parts of invention.

[0014] Moreover, invention of the 5th of this invention is a thermoplastic elastomer composition given in the 1-4th ones which contain further the (g) inorganic bulking agent 1 - 200 weight parts of invention.

[0015] Moreover, invention of the 6th of this invention is a thermoplastic elastomer composition given in the 1-5th ones which contain further (h) ester system coagent 1 - 45 weight parts of invention.

[0016] Moreover, invention of the 7th of this invention is the automatic in-the-car exterior member, the member for construction packing, or the member for household appliance packing which carries out the fabrication of the thermoplastic elastomer composition of a description to the 1-6th ones of invention.

[0017]

[Embodiment of the Invention] The component, the manufacture method, and use which constitute this invention are explained in detail below.

[0018] 1. Constituent (1) Elastomer Component of Thermoplastic Elastomer Composition (a)

The elastomer component (a) used by this invention is at least a kind of elastomer chosen from the group of the following (a-1), (a-2), and (a-3).

[0019] (a-1) A block copolymer block copolymer component (a-1) is a block copolymer which consists of at

least 2 of the polymer blocks A which use aromatic vinyls as a subject, and at least 1 of the polymer blocks B which use a conjugated diene compound as a subject. For example, the aromatic-vinyls-conjugated diene compound block copolymer which has structures, such as A-B-A, B-A-B-A, and A-B-A-B-A, can be mentioned.

[0020] The above-mentioned block copolymer contains aromatic vinyls 20 to 50weight % preferably five to 60weight %.

[0021] The polymer block A which uses aromatic vinyls as a subject consists only of aromatic vinyls, or 50 weight % or more of aromatic vinyls are a copolymer block with 70 weight % or more and a conjugated diene compound preferably.

[0022] The polymer block B which uses a conjugated diene compound as a subject consists only of a conjugated diene compound, or 50 weight % or more of conjugated diene compounds are a copolymer block with 70 weight % or more and aromatic vinyls preferably.

[0023] the number average molecular weight of a block copolymer -- desirable -- 5,000-1,500,000 -- more -- desirable -- 10,000-550,000 -- it is the range of 100,000-400,000 still more preferably, and a molecular weight distribution is ten or less. The molecular structure of a block copolymer may be any of the shape of a normal chain, branched state, radiate, or these arbitrary combination.

[0024] Moreover, the polymer block A which uses these aromatic vinyls as a subject, and a conjugated diene compound are set to the polymer block B used as a subject. distribution of the conjugated diene compound in a chain, or the unit of aromatic-vinyls origin -- randomness and tapered (that in which a chain is met, and a monomer component increases or decreases) one -- a part -- the shape of a block -- or -- these -- arbitrary -- you may combine and come to come out Two or more polymer blocks B of each polymer block which use as a subject the polymer block A which uses aromatic vinyls as a subject, or a conjugated diene compound may be structures which are different even if each is the same structure in a certain case, respectively.

[0025] As aromatic vinyls which constitute a block copolymer, for example, one sort or two sorts or more can be chosen from among styrene, alpha-methyl styrene, vinyltoluene, p-tertiary butyl styrene, etc., and styrene is especially desirable. Moreover, as a conjugated diene compound, for example, one sort or two sorts or more are chosen from among butadiene, isoprene, 1,3-pentadiene, 2, and 3-dimethyl 1,3-butadiene etc., and butadiene, isoprene, and these combination are especially desirable.

[0026] As an example of the above-mentioned block copolymer, styrene Butadiene Styrene (SBS), a styrene isoprene styrene copolymer (SIS), etc. are mentioned.

[0027] Although many methods are proposed as the manufacture method of these block copolymers, as a typical method, using a lithium catalyst or a Ziegler type catalyst, block polymerization can be carried out and it can obtain in an inactive medium by the method indicated, for example to JP,S40-23798,B.

[0028] (a-2) [a hydrogenation block copolymer hydrogenation block copolymer component (a-2)] It is the hydrogenation thing of (a-1), and is the hydrogenation thing of the block copolymer which consists of at least 2 of the polymer blocks A which use aromatic vinyls as a subject, and at least 1 of the polymer blocks B

which use a conjugated diene compound as a subject.

[0029] In the polymer block B which is one of the hydrogenation things of a component (a-1), and uses a conjugated diene compound as a subject, although the rate of hydrogenation is arbitrary, it is 60% or more still more preferably 55% or more more preferably 50% or more. Moreover, the microstructure is arbitrary, for example, 1 and 2-microstructure is 25 to 45 weight % especially preferably 20 to 50weight % preferably in a polybutadiene block. Moreover, you may be the thing which hydrogenated 1 and 2-binding alternatively. In a polyisoprene block, the thing of the aliphatic series double bond of isoprene which 70 to 100 weight % has 1 and 4-microstructure preferably, and originates in isoprene to which hydrogenation of at least 90% was carried out preferably is desirable.

[0030] When using the block copolymer hydrogenated by the use, the above-mentioned hydrogenation thing can be preferably used suitably according to a use.

[0031] (a-2) as an example of the hydrogenation block copolymer of a component A styrene ethylene butene styrene copolymer (SEBS), a styrene ethylene propylene styrene copolymer (SEPS), Styrene ethylene ethylene propylene styrene copolymer (SEEPS; that is) The hydrogenation thing of a styrene butadiene isoprene styrene copolymer, a styrene butadiene butylene styrene copolymer (partially-hydrogenated styrene Butadiene Styrene, SBBS), etc. can be mentioned.

[0032] (a-3) [an olefin system copolymer rubber olefin system copolymer rubber component (a-3)] The olefin system copolymer rubber in which the elastomer or these in which alpha olefin, such as ethylene, propylene, 1-butene, and 1-pentene, carries out copolymerization, and nonconjugated diene carry out copolymerization is mentioned.

[0033] As nonconjugated diene, dicyclopentadiene, 1, 4-hexadiene, JISHIKURO octadien, methylene norbornene, 5-ethylidene 2-norbornene, etc. can be mentioned.

[0034] As such olefin system copolymer rubber Specifically, ethylene-propylene copolymer rubber, ethylene propylene nonconjugated diene copolymer rubber, ethylene-1-butene copolymer rubber, ethylene 1-butene nonconjugated diene copolymer rubber, ethylene propylene 1-butene copolymer rubber, etc. are mentioned.

[0035] (2) Amorphous polyolefin component (b)

[the amorphous polyolefin component (b) used by this invention] The melt viscosity at 190 degrees C consists of an amorphous copolymer which uses propylene of 10,000 - 25,000 mPa-s as a principal component preferably 250 to 50,000 mPa-s. The crystallinity measured by X-ray diffraction is the polymer of the comparison low molecular weight which is 20% or less preferably 50% or less. Moreover, as for the glass transition temperature of this amorphous polyolefin, -33--23 degree C is desirable, and softening temperature's 120-135 degrees C are desirable.

[0036] As an example of amorphous polyolefin, atactic polypropylene of an amorphous homopolymer, An amorphous copolymer with other alpha olefin (for example, ethylene, 1-butene, 1-pentene, 1-hexene, 4-methyl 1-pentene, 1-octene, 1-decene, etc.) which uses propylene as a subject etc. can be mentioned. Atactic polypropylene, a propylene ethylene amorphous copolymer, and a propylene 1-butene amorphous

copolymer are desirable among such amorphous polyolefin. Although a random copolymer or a block copolymer is sufficient as said amorphous polyolefin, in the case of a block copolymer, the bonding pattern of a propylene unit needs to be atactic structure. Moreover, when an amorphous copolymer is a copolymer of propylene and ethylene, more than 50 mol % of the content of this propylene unit is desirable, and it is especially desirable. [60-100mol% of] Atactic polypropylene can be obtained as a subproduct in the manufacture process of crystalline polypropylene among amorphous polyolefin.

[0037] By adding, the amorphous polyolefin component (b) can achieve the function which raises the coefficient of friction of elastomer composition mold goods, especially a static coefficient of friction, and can improve grip nature with a paint board or a glass plate.

[0038] The loadings of a component (b) are a 0.1 - 250 weight part to a (Component a) 100 weight part, and are a 30 - 100 weight part preferably. The grip nature of the elastomer composition with which loadings are obtained under in 0.1 weight part is lost. If 250 weight parts are exceeded, it will be easy to carry out bleed out of the softener from the elastomer composition obtained, and will become easy to produce exfoliation, modification, and a flow mark in mold goods.

[0039] (3) Organic peroxide component (c)

The organic peroxide component (c) used by this invention makes a radical generate, makes the radical react continuously, and serves to make a component (a) construct a bridge over. Moreover, the component (d) blended if needed is decomposed simultaneously, the flowability of the constituent at the time of fusion kneading is controlled, and it cheats out of dispersion of a rubber component good. As a component (c), for example JIKUMIRU peroxide, G tert-butyl peroxide, 2, the 5-dimethyl 2, 5-G (tert-butylperoxy) hexane, 2, the 5-dimethyl 2, 5-G (tert-butylperoxy) hexyne 3 and 1, 3-bis(tert-butylperoxy isopropyl) benzene, 1 and 1-bis (tert-butylperoxy)-3, 3, 5-trimethylcyclohexane, N-butyl 4, 4-bis(tert-butylperoxy) valerate, Benzoyl peroxide, p-chlorobenzoyl, 2, 4-dichlorobenzoyl peroxide, tert-butylperoxy benzoate, tert-butylperoxyisopropyl, diacetyl peroxide, lauroyl peroxide, tert-butyl cumyl peroxide, etc. can be mentioned. 2 from a viewpoint of odor nature, tinting, and scorch safety, the 5-dimethyl 2, 5-G (tert-butylperoxy) hexane, 2, the 5-dimethyl 2, and especially 5-G (tert-butylperoxy) hexyne 3 are [among these] desirable.

[0040] the loadings of a component (c) receive a (Component a) 100 weight part -- a 0.01 - 1.20 weight part -- it is a 0.05 - 1.0 weight part preferably. The heat-resisting property of the elastomer from which loadings cannot attain bridge formation enough, but are obtained under in 0.01 weight part, and mechanical strength are low. On the other hand, if 1.20 weight parts are exceeded, moldability will worsen.

[0041] Moreover, when the below-mentioned softener component for non-aromatic system rubber (d) lives together, as for the loadings of a component (c), it is desirable that it is 0.1 - 20 weight part to a (Component d) 100 weight part within the limits of the above-mentioned loadings. By making a component (c) into this range, the effect of suppressing shift and bleeding of the oil of a component (d) can be enlarged.

[0042] (4) The softener component (d) for non-aromatic system rubber

In the elastomer composition of this invention, the softener component for non-aromatic system rubber (d) can be blended if needed. As a component (d), the mineral oil of a non-aromatic system, or liquefied or the

synthetic softener of low molecular weight can be mentioned. The mineral oil softener used as an object for rubber is the mixture with which three persons of an aromatic ring, a naphthene ring, and a paraffin chain combined. 30% or more of thing is called an aromatic series, and, as for that paraffin series and whose naphthene ring carbon number of that in which a paraffin chain carbon number has 50% or more of the number of total carbon are 30 to 40%, the naphthene system and the aromatic series carbon number are distinguished.

[0043] The softener for mineral oil system rubber used as a component (d) of this invention is the thing of paraffin series and a naphthene system in a Type. Since a component (a) becomes meltable by the use, and the softener of an aromatic series checks crosslinking reaction and cannot aim at improvement in the physical properties of the constituent obtained, it is not desirable. As a component (d) of this invention, the thing of paraffin series is desirable and especially the thing that has a still less aromatic ring component also in paraffin series is suitable. Moreover, as liquefied or a synthetic softener of low molecular weight, polybutene, hydrogenation polybutene, low-molecular-weight polyisobutylene, etc. are mentioned.

[0044] As for the description of these softeners for non-aromatic system rubber, it is desirable that dynamic viscosity [in / in the dynamic viscosity at 37.8 degrees C / 20 - 50,000cSt and 100 degrees C] shows 5 - 1,500cSt, a pour point shows -10--15 degree C, and a flash point (COC) shows 170-300 degrees C. Furthermore, the thing of 100-2,000 has a desirable weight average molecular weight.

[0045] When blending, the loadings of a component (d) have a desirable 1 - 100 weight part to a (Component a) 100 weight part, and are 5 - 60 weight part more preferably. If loadings exceed 100 weight parts, it will be easy to carry out bleed out of the softener from the elastomer composition obtained, and will become easy to produce exfoliation, modification, and a flow mark in mold goods.

[0046] (5) Low-specific-gravity paraffin component (e)

A low-specific-gravity paraffin component (e) can be blended with the elastomer composition of this invention if needed. A component (e) demonstrates the effect of preventing the bleed out of a softener from a constituent. As a component (e), with a specific gravity of 0.8 or less liquid paraffin is mentioned, and neo thio ZORU made from Sanko Chemistry (trademark) etc. is mentioned as a commercial item.

[0047] A 1 - 100 weight part is desirable more desirable to a (Component a) 100 weight part, and the loadings of a component (e) are 3 - 50 weight part, when blending. If 100 weight parts are exceeded, while the fall of the mechanical strength of the elastomer composition obtained will be remarkable and the development gas at the time of processing will become remarkable, the grip nature of the obtained product is lost.

[0048] (6) Peroxide decomposition type olefin system resinous principle (f)

In the elastomer composition of this invention, a peroxide decomposition type olefin system resinous principle (f) can be blended if needed. A component (f) has an effect in adjustment of hardness and contraction while it makes good the rubber content powder of the elastomer composition obtained and makes appearance of mold goods good. By heat-treating under existence of peroxide, carry out the pyrolysis of this component and it reduces molecular weight. It is the polymer or copolymer of an olefin

system with which the flowability at the time of fusion increases. For example, a copolymer with isotactic polypropylene, propylene, other alpha olefin, for example, ethylene, 1-butene, 1-hexene, 4-methyl 1-pentene, 1-octene, etc. can be mentioned.

[0049] The fusing point by the DSC measurement of the homopolymerization portion of the above-mentioned olefin system copolymer is the thing of the range whose T_m is 150-167 degrees C and whose ^{**}H_m is 25 to 83 mJ/mg preferably. Crystallinity can be presumed from T_m of DSC measurement, and ^{**}H_m. Out of the range of the above [T_m and ^{**}H_m], neither the oil resistance of the elastomer composition obtained nor the rubber elasticity at 100 degrees C or more is improved.

[0050] moreover, the melt flow rate (MFR, ASTM D-1238, L conditions, 230 degrees C) of a component (f) -- desirable -- 0.1-200g/-- they are 0.5 - 10 100g / minutes still more preferably for 10 minutes. If the moldability of the elastomer composition with which MFR is obtained in 0.1g / less than 10 minutes gets worse and it exceeds 200g / 10 minutes, the mechanical strength of the elastomer composition obtained will fall.

[0051] When blending, the loadings of a component (f) have a desirable 1 - 100 weight part to a (Component a) 100 weight part, and are 3 - 40 weight part more preferably. If 100 weight parts are exceeded, the moldability of the obtained elastomer composition will get worse. When become easy to produce exfoliation, modification, and a flow mark in mold goods, the hardness of an elastomer composition becomes high too much, plasticity is lost, and the product of a rubber feel is not obtained, therefore it uses as a lip of the inner exterior member of a car, grip nature with an automotive body gets worse.

[0052] (7) Inorganic bulking agent component (g)

In the elastomer composition of this invention, an inorganic bulking agent component (g) can be blended if needed. A component (g) has an advantage on the economy by increase in quantity besides the effect of improving some [, such as compression permanent deformation of the mold goods obtained from an elastomer composition,] physical properties. As a component (g), calcium carbonate, a talc, silica, diatomaceous earth, barium sulfate, Magnesium carbonate, magnesium hydroxide, mica, Clay, titanium oxide, carbon black, glass fiber, a hollow glass balloon, carbon fiber, titanitic acid calcium fiber, natural *****, synthetic ***** (white carbon), etc. are mentioned. Calcium carbonate and especially a talc are [among these] desirable.

[0053] When blending, the loadings of a component (g) have a desirable 1 - 200 weight part to a (Component a) 100 weight part, and are a 3 - 100 weight part more preferably. If 200 weight parts are exceeded, the fall of the mechanical strength of the elastomer composition obtained is remarkable, and hardness will become high, plasticity will be lost, and the product of a rubber feel will no longer be obtained.

[0054] (8) Ester system coagent component (h)

In the elastomer composition of this invention, an ester system coagent component (h) can be used if needed. A component (h) can be blended on the occasion of the bridge formation treatment by the above-mentioned (c) organic peroxide of the elastomer composition of this invention, and, thereby, can perform homogeneity and efficient crosslinking reaction. Moreover, by blending so much, a bridge can be moderately constructed in the softener for non-aromatic system rubber, especially low-molecular-weight paraffinic oil,

etc., and the bleed out from an elastomer composition can be controlled.

[0055] As an example of a component (h), for example Triallyl cyanurate, ethylene glycol dimethacrylate, Diethylene glycol dimethacrylate, triethylene glycol dimethacrylate, The number of repetitions of tetraethylene glycol dimethacrylate and ethylene glycol Polyethylene glycol dimethacrylate of 9-14, Trimethylolpropanetrimethacrylate, allyl compound methacrylate, The 2-methyl 1, 8-octanediol dimethacrylate, 1, a polyfunctional methacrylate compound like 9-nonane diol dimethacrylate, Polyethylene glycol diacrylate, 1, 6-hexanediol diacrylate, A polyfunctional acrylate compound like neopentyl glycol diacrylate and propylene glycol diacrylate, vinyl butyrate, or polyfunctional vinyl compounds like vinyl stearate can be mentioned. These may combine independent or two kinds or more. Triethylene glycol dimethacrylate and especially tetraethylene glycol dimethacrylate are desirable among these coagents.

[0056] When blending, the loadings of a component (h) have desirable 1 - 45 weight part to a (Component a) 100 weight part, and are 3 - 20 weight part more preferably. If 45 weight parts are exceeded, the degree of bridge formation will fall by self-polymerization nature, and an effect will no longer be acquired.

[0057] Moreover, when a component (h) and a component (d) live together, as for the loadings of a component (h), it is desirable that it is a 0.5 - 100 weight part to a (Component d) 100 weight part within the limits of the above-mentioned loadings. By making a component (h) into this range, the effect of suppressing shift and bleeding of the oil of a component (d) can be enlarged.

[0058] (9) The thing which are other components and for which various kinds of antiblocking agents, a seal nature improvement agent, a thermostabilizer, an antioxidant, light stabilizer, an ultraviolet ray absorbent, lubricant, a nucleus agent, a colorant, etc. other than the above-mentioned component are contained further if needed is also possible for the elastomer composition of this invention. As an antioxidant, here, for example 2, 6-G tert-p-butyl p-cresol, 2, 6-G tert-butylphenol, 2, 4-dimethyl 6-tert-butylphenol, Phenolic antioxidants, such as 4 and 4-dihydroxydiphenyl and tris (2-methyl 4-hydroxy 5-tert-buthylphenyl) butane, a phosphite system antioxidant, a thioether system antioxidant, etc. are mentioned. Among these, a phenolic antioxidant and especially a phosphite system antioxidant are desirable. A 0 - 3.0 weight part is desirable especially desirable to a total of 100 weight parts of above-mentioned component (a) - (h), and an antioxidant is a 0.1 - 1.0 weight part.

[0059] 2. the thermoplastic elastomer composition of manufacture this invention of a thermoplastic elastomer composition accepts above-mentioned component (a) - (c) or necessity -- component (d) - (h) etc. -- in addition, it can manufacture by adding each component to simultaneous or arbitrary order, and carrying out fusion kneading.

[0060] Restriction in particular does not have the method of fusion kneading, and a well-known method can usually be used for it. For example, a single screw extruder, a twin screw extruder, a roll, a Banbury mixer, or various kinds of kneaders can be used. For example, the above-mentioned operation can also be continuously performed by using the twin screw extruder of moderate ratio of length to diameter, a Banbury mixer, a pressurized kneader, etc. The temperature of fusion kneading here is 160-220 degrees C preferably.

[0061] 3. [Thermoplastic Elastomer Composition of Use this Invention of Thermoplastic Elastomer Composition] Since it excels in multilayer injection-molding nature, multilayer extrusion moldability, heat deformation properties, and grip nature with a paint board or a glass plate, it can use as material, such as an inner exterior member of a car, a member for construction packing, and a member for household appliance packing, and the grip nature of this member, and a metal and glass can be improved.

[0062]

[Example] Although the following work examples and a comparative example explain this invention concretely, this invention is not limited only to these work examples. In addition, the measuring method and sample of physical properties which were used by this invention are shown below.

[0063] 1. Physical-properties measuring method (1) hardness : JIS K Based on 6253, the specimen used the 6.3mm thickness press sheet.

[0064] (2) Tensile strength : JIS K Based on 6251, the specimen pierced and used the 1mm thickness press sheet for the No. 3 dumb bell test specimen. The speed of testing was considered as a part for 500mm/. (It measured at a room temperature and 100 degrees C.)

[0065] (3) 100% elongation stress : JIS K Based on 6251, the specimen pierced and used the 1mm thickness press sheet for the No. 3 dumb bell test specimen. The speed of testing was considered as a part for 500mm/.

[0066] (4) Elongation at break : JIS K Based on 6251, the specimen pierced and used the 1mm thickness press sheet for the No. 3 dumb bell test specimen. The speed of testing was considered as a part for 500mm/.

[0067] (5) Static coefficient of friction : the Gakushin-type abrader by HEIDON (HEIDON-14DK: new east science) It used, the SUS ball indenter was set to the wear jig, the wear jig was further put on the extrusion sheet surface, and it measured by 200g of vertical loads, movement speed 200 mm/min, and 50mm of migration length.

[0068] (6) Grip nature evaluation test : the stress which carries an extrusion sheet, pulls by speed-of-testing 10 mm/min using a tensile testing machine, and begins to move by 200g/cm² of vertical load on a paint board or a glass plate was measured.

[0069] (7) Compression permanent deformation (CS%) : JIS K Based on 6262, the specimen carried out 6.3mm thickness press sheet use. It measured on condition of modification 100 degree-Cx 22 hours, and 25%.

[0070] (8) Extrusion nature : extrusion of the sheet (50mm x 1mm) was carried out, drawdown nature, surface appearance, and form were observed, and the following basis estimated.

O : -- good x: -- bad [0071] (9) Injection-molding nature : injection molding of the 130mmx130mmx2mm sheet was carried out, the appearance was observed by viewing, and the following basis estimated the existence of the flow mark and the HIKE development.

O : -- good x: -- bad [0072] (10) Bleed resistance : the extruded sheet which was bent and was fixed with a clip was neglected in a room temperature and 110-degree C atmosphere for 168 hours, bleeding of a low-

molecular-weight thing and the existence of blooming were observed by viewing, and the following basis estimated.

O : -- good x: -- bad [0073] 2. Sample (1) SBS Block Copolymer Component (a-1):VECTOR2518 Used in Work Example and Comparative Example (Trademark; made by DEXCO POLYMERS)

(2) Hydrogenation block copolymer component (a-2) : SEPUTON 4077 (trademark; made by Kuraray Co., Ltd.), Styrene content : 30 weight %, isoprene content:70 weight %, number average molecular weight: -- 260,000, weight average molecular weight:320,000, molecular weight distribution:1.23, and rate of hydrogenation:90% or more olefine-copolymer [(3)] rubber component (a-3):ethylene-propylene copolymer (EPR); S PUREN WO741 (made by SUMITOMO CHEMICAL COMPANY LIMITED) -- Ethylene butene copolymer (EBR); S PUREN N0441 (made by SUMITOMO CHEMICAL COMPANY LIMITED)

(4) Amorphous polyolefin (APE) (component b):E-1200 (trademark; made by Eastman Chemikal), The propylene ethylene-copolymer (5) organic-peroxide component (c) of melt-viscosity:20,000 (mPa-s) at 190 degrees C: Par hexa 25B (trademark; made by NOF CORPORATION)

(6) Softener component (d) : Diana process oil PW-90 (trademark; made by IDEMITSU KOSAN CO. LTD.)

(7) Low-specific-gravity paraffin component (e) : neo thio ZORU (trademark; made by Sanko chemistry incorporated company), Specific gravity 0.761(8) peroxide decomposition type polypropylene component (f) :PP-BC8 (trademark; made by Japan Polychem, Inc.), Crystallinity: Tm166 degree C, **Hm82mJ/mg, MFR1.8g / (9) 10-minute calcium carbonate (component g):NS400 (trademark; made by Sankyo fine powder incorporated company)

(10) Coagent (component h):NK ester 3G (trademark; made by Aranaka village chemistry incorporated company)

(11) Hindered phenol / FOSU fight / lactone system compound antioxidant (component i):H.P.2215 (trademark; made in Tiba Speciality Chemicals)

[0074] Using each component of the quantity shown in work examples 1-6 and one to example of ** 4 Table 1 and 2, it supplied to the twin screw extruder of 47, and by the mixing temperature of 180 degrees C, and 350rpm of screw rotation speed, ratio of length to diameter carried out fusion kneading, and pelletized. Next, injection molding of the obtained pellet was carried out, the specimen was created, and each examination was presented. An evaluation result is shown in Table 1 and 2.

[0075]

[Table 1]

			実施例					
			1	2	3	4	5	6
成分組成	成分 (a-1) SBS	重量部	100	0	0	0	35	35
	成分 (a-2) SEPS	重量部	0	0	0	100	20	20
	成分 (a-3) EPR	重量部	0	100	0	0	0	0
	成分 (a-3) EBR	重量部	0	0	100	0	45	45
	成分 (b) APE	重量部	60	60	60	60	35	35
	成分 (c) Peroxide	重量部	0.25	0.25	0.25	0.25	0.25	0.25
	成分 (d) PW90	重量部	0	0	0	0	35	17.5
	成分 (e) NEOTIOZOL	重量部	0	0	0	0	0	17.5
	成分 (f) PP	重量部	0	0	0	0	20	20
	成分 (g) CaCO ₃	重量部	0	0	0	0	55	55
	成分 (h) NK Ester	重量部	0	0	0	0	7	7
	成分 (i) Antioxidant	重量部	0.3	0.3	0.3	0.3	0.3	0.3
評価結果	比重		0.98	0.9	0.9	0.9	1.05	1.03
	硬度		45	49	46	48	56	56
	引張強さ (室温)	MPa	3.4	6.5	6.0	5.0	3.3	5.1
	引張強さ (100℃)	MPa	0.3	1	1.1	0.8	0.3	1
	100%応力	MPa	1.1	2.1	2.0	1.8	1.2	1.8
	破断伸び	%	860	850	850	900	880	880
	静摩擦係数	—	2	2.1	2.0	1.8	1.2	1.8
	グリップ性	g	300<	300<	300<	240	220	230
	圧縮永久歪み(100℃、22hr)	%	—	—	—	55	60	—
	押出成形性	—	○	○	○	○	○	○
	射出成形性	—	○	○	○	○	○	○
	耐ブリード性	—	—	—	—	—	○	○

[0076]

[Table 2]

			比較例			
			1	2	3	4
成分組成	成分 (a-1) SBS	重量部	35	35	35	35
	成分 (a-2) SEPS	重量部	20	20	20	20
	成分 (a-3) EPR	重量部	0	0	0	0
	成分 (a-3) EBR	重量部	45	45	45	45
	成分 (b) APE	重量部	0	270	35	35
	成分 (c) Peroxide	重量部	0.25	0.25	0	1.25
	成分 (d) PW90	重量部	17.5	17.5	17.5	17.5
	成分 (e) NEOTIOZOL	重量部	17.5	17.5	17.5	17.5
	成分 (f) PP	重量部	20	20	20	20
	成分 (g) CaCO ₃	重量部	55	55	55	55
	成分 (h) NK Ester	重量部	7	7	7	7
	成分 (i) Antioxidant	重量部	0.3	0.3	0.3	0.3
評価結果	比重		1.06	1.03	1.05	1.05
	硬度		63	48	54	58
	引張強さ (室温)	MPa	6.3	3.1	5.9	5.3
	引張強さ (100℃)	MPa	1.3	0.1>	0.1>	1.3
	100%応力	MPa	2.1	1	1.5	2
	破断伸び	%	750	900	880	750
	静摩擦係数	—	0.7	2.1	1.6	0.9
	グリップ性	g	50	300<	300<	60
	圧縮永久歪み(100℃、22hr)	%	—	—	—	55
	押出成形性	—	○	×	×	×
	射出成形性	—	○	×	×	×
	耐ブリード性	—	○	×	×	○

[0077] Work examples 1-6 are the thermoplastic elastomer compositions of this invention so that more clearly than Table 1 and 2. Component (d) which is an optional component Description with any good

thermoplastic elastomer composition was shown irrespective of the existence of - (h). moreover, some or all of SEPUTON 4077 of a component (a-2) -- tough tech P JT-90 (an Asahi Chemical Co., Ltd. make styrene butadiene butylene styrene copolymer --) Even if it replaces by weight average molecular weight (Mw):110,000, (number average molecular weight Mn):99,000, and molecular weight distribution:1.11 SBBS and styrene content:30weight % The good result was obtained similarly.

[0078] On the other hand, comparative examples 1 and 2 carry out the loadings of a component (b) out of the range of this invention. If there are few components (b), a static coefficient of friction will become low and grip nature will be spoiled. Moldability will be spoiled if there are many components (b). Comparative examples 3 and 4 carry out the loadings of a component (c) out of the range of this invention. If there are few components (c), bridge formation will not fully be performed, but if a heat-resisting property and moldability are not enough and there are many components (c), bridge formation will advance too much and grip nature will be spoiled.

[0079]

[Effect of the Invention] The thermoplastic elastomer composition of this invention can be used for the inner exterior member of the car which is excellent in grip nature with the bleed resistance of extrusion nature, injection-molding nature, a lamina, and multilayer mold goods, heat deformation properties, a paint board, a glass plate, etc., the member for construction packing, and the member for household appliance packing.

[Translation done.]